

Claims

- [c1] A method to automatically create a three-dimensional nail object, comprising:
starting with a three-dimensional array of data representing a digitized nail surface, and;
measuring key reference points along the nail surface along the X-axis, Y-axis and Z-axis, and;
using supplied parameters to automatically create a desired three-dimensional representation of an artificial nail object, by generating new three-dimensional data along the X-axis, Y-axis and Z-axis as determined by the supplied parameters, and;
the final nail object is a combination of the digitized nail surface and the generated three-dimensional surface so as to create a desired artificial nail object that conforms to an expected result so that the nail object will fit over the digitized nail surface and create a desired artificial nail appearance.
- [c2] The method of Claim 1, wherein starting with a three-dimensional array of data representing a digitized nail surface includes any data that can be used to represent a three-dimensional object.

- [c3] The method of Claim 1, wherein the three-dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis.
- [c4] The method of Claim 1, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length.
- [c5] The method of Claim 1, wherein measuring key reference points includes determining the arc of the nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.
- [c6] The method of Claim 1, wherein measuring key reference points includes evaluating three-dimensional points along the periphery of the nail surface.
- [c7] The method of Claim 1, wherein measuring key reference points includes evaluating three-dimensional points along the nail surface at key points including;
points along the Y-axis through the center of the nail surface when viewed along its X-axis, and;
points along the X-axis located at approximately 2/3rds the distance from the edge of the cuticle end of the nail surface measured on the Y-axis. This intersection repre-

sents the highest point reference of the generated nail object, or;
using all or any substantial portion of three-dimensional points of the nail surface.

- [c8] The method of claim 1, wherein using supplied parameters includes constant parameters that are predetermined. Where these parameters include predetermined curves, lengths, widths and heights, which are consistent with the desired object dimensions. These constants may be changed to create the desired nail object.
- [c9] The method of Claim 1, wherein using supplied parameters includes supplying the parameters at the time the object is created. Where these parameters include predetermined curves, lengths, widths and heights, which are consistent with the desired object dimensions.
- [c10] The method of Claim 1, wherein generating new three-dimensional data includes using the supplied parameters to mathematically create new three-dimensional data that forms the top surface of the desired nail object, where the supplied parameters dictate the top surface data that is generated.
- [c11] The method of Claim 1, wherein generating new three-dimensional data includes using the supplied parameters

to mathematically create new three-dimensional data that forms a nail tip for the desired object, further where any potential holes in the three-dimensional data occur, they are filled during the generation method.

[c12] The method of Claim 1, wherein the desired nail object is achieved by combining the new generated surface as the top surface of the desired nail object and the digitized nail surface forms the bottom surface of the desired nail object. The two surfaces are then combined to create the desired nail object.

[c13] The method of Claim 1, wherein the desired nail object in its final state is a customized three-dimensional object representing an artificial nail that is desired, which fits over the digitized nail surface.

[c14] A process to automatically create a three-dimensional nail object, comprising:
starting with a three-dimensional array of data representing a digitized nail surface, and;
measuring key reference points along the nail surface along the X-axis, Y-axis and Z-axis, and;
using supplied parameters to automatically create a desired three-dimensional representation of an artificial nail object, by generating new three-dimensional data along the X-axis, Y-axis and Z-axis as determined by

the supplied parameters, and;
the final nail object is a combination of the digitized nail surface and the generated three-dimensional surface so as to create a desired artificial nail object that conforms to an expected result so that the nail object will fit over the digitized nail surface and create a desired artificial nail appearance.

[c15] The process of Claim 14, wherein starting with a three-dimensional array of data representing a digitized nail surface includes any data that can be used to represent a three-dimensional object.

[c16] The process of Claim 14, wherein the three-dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis.

[c17] The process of Claim 14, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length.

[c18] The process of Claim 14, wherein measuring key reference points includes determining the arc of the nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.

- [c19] The process of Claim 14, wherein measuring key reference points includes evaluating three-dimensional points along the periphery of the nail surface.
- [c20] The process of Claim 14, wherein measuring key reference points includes evaluating three-dimensional points along the nail surface at key points including; points along the Y-axis through the center of the nail surface when viewed along its X-axis, and; points along the X-axis located at approximately 2/3rds the distance from the edge of the cuticle end of the nail surface measured on the Y-axis. This intersection represents the highest point reference of the generated nail object, or; using all or any substantial portion of three-dimensional points of the nail surface.
- [c21] The process of claim 14, wherein using supplied parameters includes constant parameters that are predetermined. Where these parameters include predetermined curves, lengths, widths and heights, which are consistent with the desired object dimensions. These constants may be changed to create the desired nail object.
- [c22] The process of Claim 14, wherein using supplied parameters includes supplying the parameters at the time the

object is created. Where these parameters include pre-determined curves, lengths, widths and heights, which are consistent with the desired object dimensions.

[c23] The process of Claim 14, wherein generating new three-dimensional data includes using the supplied parameters to mathematically create new three-dimensional data that forms the top surface of the desired nail object, where the supplied parameters dictate the top surface data that is generated.

[c24] The process of Claim 14, wherein generating new three-dimensional data includes using the supplied parameters to mathematically create new three-dimensional data that forms a nail tip for the desired object, further where any potential holes in the three-dimensional data occur, they are filled during the generation process.

[c25] The process of Claim 14, wherein the desired nail object is achieved by combining the new generated surface as the top surface of the desired nail object and the digitized nail surface forms the bottom surface of the desired nail object. The two surfaces are then combined to create the desired nail object.

[c26] The process of Claim 14, wherein the desired nail object in its final state is a customized three-dimensional ob-

ject representing an artificial nail that is desired, which fits over the digitized nail surface.

[c27] A computer program to automatically create a three-dimensional nail object, comprising:
starting with a three-dimensional array of data representing a digitized nail surface, and;
measuring key reference points along the nail surface along the X-axis, Y-axis and Z-axis, and;
using supplied parameters to automatically create a desired three-dimensional representation of an artificial nail object, by generating new three-dimensional data along the X-axis, Y-axis and Z-axis as determined by the supplied parameters, and;
the final nail object is a combination of the digitized nail surface and the generated three-dimensional surface so as to create a desired artificial nail object that conforms to an expected result so that the nail object will fit over the digitized nail surface and create a desired artificial nail appearance.

[c28] The computer program of Claim 27, wherein starting with a three-dimensional array of data representing a digitized nail surface includes any data that can be used to represent a three-dimensional object.

[c29] The computer program of Claim 27, wherein the three-

dimensional array of data may be represented as points of data representing an X-axis, Y-axis and Z-axis.

[c30] The computer program of Claim 27, wherein measuring key reference points includes determining the measurement value in millimeters or inches of the nail surface along its X-axis, Y-axis and Z-axis; where X-axis represents width, Y-axis represents the length.

[c31] The computer program of Claim 27, wherein measuring key reference points includes determining the arc of the nail surface along the X-axis and/or determining the arc of the nail surface along the Y-axis.

[c32] The computer program of Claim 27, wherein measuring key reference points includes evaluating three-dimensional points along the periphery of the nail surface.

[c33] The computer program of Claim 27, wherein measuring key reference points includes evaluating three-dimensional points along the nail surface at key points including;
points along the Y-axis through the center of the nail surface when viewed along its X-axis, and;
points along the X-axis located at approximately 2/3rds the distance from the edge of the cuticle end of the nail surface measured on the Y-axis. This intersection repre-

sents the highest point reference of the generated nail object, or;
using all or any substantial portion of three-dimensional points of the nail surface.

[c34] The computer program of Claim 27, wherein using supplied parameters includes constant parameters that are predetermined. Where these parameters include predetermined curves, lengths, widths and heights, which are consistent with the desired object dimensions. These constants may be changed to create the desired nail object.

[c35] The computer program of Claim 27, wherein using supplied parameters includes supplying the parameters at the time the object is created. Where these parameters include predetermined curves, lengths, widths and heights, which are consistent with the desired object dimensions.

[c36] The computer program of Claim 27, wherein generating new three-dimensional data includes using the supplied parameters to mathematically create new three-dimensional data that forms the top surface of the desired nail object, where the supplied parameters dictate the top surface data that is generated.

- [c37] The computer program of Claim 27, wherein generating new three-dimensional data includes using the supplied parameters to mathematically create new three-dimensional data that forms a nail tip for the desired object, further where any potential holes in the three-dimensional data occur, they are filled during the generation through the computer program.
- [c38] The computer program of Claim 27, wherein the desired nail object is achieved by combining the new generated surface as the top surface of the desired nail object and the digitized nail surface forms the bottom surface of the desired nail object. The two surfaces are then combined to create the desired nail object.
- [c39] The computer program of Claim 27, wherein the desired nail object in its final state is a customized three-dimensional object representing an artificial nail that is desired, which fits over the digitized nail surface.